What we cannot learn from the Irish experience: A fundamental asymmetry of asymmetric shocks

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Abstract

A simple N-country specific-factor type model with imperfectly mobile labour is developed. It is shown that the effects of country-specific producitivity shocks hitting a small country are fundamentally asymmetric. A positive shock will be accomodated by a moderate wage increase and sizable in-migration, whereas a negative shock will be accomodated by a significant decrease in wages and moderate out-migration. The effects of shocks in a monetary union are discussed, and it is argued that the results are consistent with the recent Irish experience. The welfare effects of small economic fluctuations are also discussed.

JEL Classification: E24, F16, F22
Keywords: migration, asymmetric shocks

1 Introduction

It is well understood that country-specific shocks are one potentially serious problem when a common currency is introduced among several countries. A case in question is the introduction of a new common currency in Europe—the Euro. When countries can no longer adjust to country-specific shocks, often called *asymmetric shocks,* by adjustments of their exchange rates something else has to accommodate the shock: wages must be flexible, large transfers between countries must be possible, or labour must be geographically mobile. It is an empirical fact that wages so far have not been very flexible in Europe[1]. Large transfers between countries in Europe are difficult to envisage unless the EU budget is radically increased. Finally there is migration. Indeed, free mobility of people is one of the pillars of the common market in Europe. Nevertheless, labour mobility is generally quite low within the European union. The mobility, however, varies greatly between different groups of workers in a country. Schröder (1996) shows

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[1]See e.g. Siebert (1997).

that the propensity to emigrate, defined as the percentage share of a particular population group that emigrates during one year, varies greatly between different groups of workers[2]. The propensity to emigrate also differs markedly across countries[3].

The aim of this paper is to explore the effects of country-specific shocks in a world with at least three symmetric countries or with two countries of different size. The reason for this *proviso* is the important fact that some consequences of country-specific shocks will never show up in symmetric two-country models. The other key characteristic of our model is that workers are *imperfectly mobile* in the sense that the willingness to migrate differs in the population. In precise terms, the compensating wage differential necessary to induce a worker to move is distributed in the population. The fundamental reason for this varying propensity to migrate is unimportant for our analysis. It may be due to varying moving costs—for instance, because of different education levels—or it may simply be due to varying degrees of locational attachment.

Our main result is that the effects of country-specific shocks are *asymmetric* in the following important sense: a favorable country-specific shock in a small country will have less dramatic consequences than a similarly sized unfavorable shock. That is, a positive shock gives a relatively weak positive effect on real wages, while a negative shock gives a strong negative effect. The reason for this is, basically, that the equilibrating streams of migration require smaller relative wage adjustments in the former case than in the latter. Put simply, the size of the country subject to the shock *relative to* the size of the relevant economic environment matters. For practical purposes this means that it is misleading to extrapolate the effects of a positive shock when trying to calculate the effects of a negative shock.

The forces at work in the model can, we believe, throw light on the current development in Ireland. The background is the following. For a number of reasons, the level of economic activity and growth in Ireland was significantly higher than in the rest of the Euro countries at the point in time (the turn of the year between 1998 and 1999) when the Euro was launched. There was widespread concern that this would lead to the macroeconomic development getting out of hand when monetary policy no longer was available as a regulator of economic activity. These fears have, however, not been borne out by the development. Rather, Ireland has witnessed an unprecedented wave of in-migration of labour, which, moreover, is in glaring contrast to much of Irish history. *The Economist* (August 28, 1999) gives a lucid account of the wave of immigration, pointing out that a large proportion of the wave of immigration is made up of two categories: people who are exceptionally mobile due to their age and their up-bringing, and previously out-migrated Irishmen. One observation made in this paper is that this situation reflects a general fact—*viz.* the fact that a small country subject to a positive shock will have a large pool of potential immigrants and that wage increases necessary to induce immigration therefore will be moderate. With this observation comes a very important complementary observation—

[2] For instance university graduates in the Scandinavian countries have a propensity to emigrate that is roughly four times as large as workers with only primary education.

[3] Danes, for instance, have 2.6 times as high average propensity to emigrate as Swedes.

viz. that this logic works the other way when a small country is subject to a negative shock. The out-migration necessary to accommodate a negative shock must be undertaken by workers from the small pool consisting of workers residing in the country subject to the shock, and the magnitude of the compensating wage changes required will be considerably larger.

This *asymmetry* in the effects of negative and positive shocks is the main message of the paper. It turns out, however, that this asymmetry, in addition, has implications for the welfare effects of economic fluctuations. The observation that negative effects of negative country-specific shocks are relatively harsh on real wages in terms of their magnitude relies on the distribution of workers' willingness to move being essentially homogeneous across countries. If, however, a small country has an exceptionally mobile population—or, to be precise, if a large enough proportion of the population is willing to move in response to small wage incentives—the situation it faces will be different. Then, the workers of the country in question will actually benefit on average from the existence of (small) economic fluctuations. Although less compelling empirically, we believe that this observation is important for understanding the interaction among labour mobility, taxes and economic fluctuations. If small-country workers are *not* exceptionally mobile, the owners of immobile capital in small countries are likely to benefit on average from small economic fluctuations.

We present below a very simple model that illustrates our point. The same qualitative result may in principle be shown in many standard trade models if imperfect factor mobility is assumed. One example would be the Heckscher-Ohlin model with a country-specific and sector-specific technological shock.

While our approach seems non-standard for addressing issues having to do with "asymmetric shocks" and macroeconomic fluctuations, there has been work on related issues in the macroeconomics literature. An explicit attempt to characterise the inefficiency resulting from the loss of monetary policy as an instrument for dealing with asymmetric shocks is Lane (1996); he shows that there is indeed such a cost[4]. There has also been a great deal of discussion of the Euro project starting out from the idea of "optimum currency areas." An effort to operationalise this notion is Bayoumi and Eichengreen (1997); they develop an index intended to capture the economic closeness among European countries in the relevant sense. Bayoumi and Eichengreen find that popular notions of economic "closeness" among European countries are confirmed by their analysis. They note that economic integration contributes to bringing countries more closely together in the sense of their index; noting that monetary integration may encourage trade they point to the potential for a self-reinforcing circle of measures bringing the countries more closely together.

In the next section we develop the model, and in Section 3 we analyse the effects of country-specific shocks. In Section 4 we digress into some tentative welfare analysis; Section 5 is a conclusion.

[4] He also shows that the adjustments of the central monetary authority are equivalent to the obeying of the "McKinnon rule" under fixed exchange rates.

2 The model

There are two countries, 1 and 2, producing a good X under constant returns using labour, L, and terrain, T, as inputs. Country 2 is shorthand for a group of N equally-sized countries; we will refer to country 2 both as 'the large country' and as 'the group of countries.'[5] T is geographically fixed, while L can migrate between countries. The good is freely traded. The return to terrain goes domestic or foreign to terrain (land) owners, that are outside the model. The utility function of worker i depends on his material consumption and on his country of residence, j, according to

$$U^i = X^i \cdot \phi^i(j), \tag{1}$$

where the last factor—expressing the location preference—will be specified below. The production function in country j is

$$X_j = AL_j^{\alpha} T_j^{1-\alpha}, \quad 0 < \alpha < 1, \tag{2}$$

and we choose this good as numeraire so that its price is $p \equiv 1$. The real wage (i.e. the indirect utility of workers net of the location preference) in country j, ω_j, is

$$\omega_j = \alpha A \left(\frac{T_j}{L_j}\right)^{(1-\alpha)}, \tag{3}$$

while the return to terrain, r_j^T, is

$$r_j^T = (1-\alpha) A \left(\frac{L_j}{T_j}\right)^{\alpha}. \tag{4}$$

The return to terrain will be discussed toward the end of Section 3. We will assume that country 2 initially is N times larger than country 1; i.e., that both the labour force and terrain is N times larger in country 2. This implies that initially $\omega_1 = \omega_2$.

Labour is mobile between the two countries but has a locational bias. That is, for reasons such as language etc. individuals find it costly to migrate to the other country. The size of these costs varies among agents, while virtually zero for some individuals the costs may be very large for others. Individual i weights utility, given by the real wage, from country 1 by $\phi^i(1) = 1 - \gamma_i$ and utility from country 2 by $\phi^i(2) = 1 + \gamma_i$. By construction, $1/(N+1)$ of the population prefers staying in country 1 at equal wages. We assume that the preference parameter, γ_i, of these workers is uniformly distributed on $[-a, 0]$, and that the preference parameter for those preferring country 2 is uniformly distributed on $[0, b]$. That is, γ_i is distributed on the interval $[-a, b]$ and the density function is

$$f(\gamma) = \begin{cases} 1/(N+1)a & \text{if} \quad \gamma < 0 \\ N/(N+1)b & \text{if} \quad \gamma \geq 0 \end{cases}. \tag{5}$$

[5] Both interpretations are arguably natural in the light of our thinking of country 2 as the rest of the monetary union.

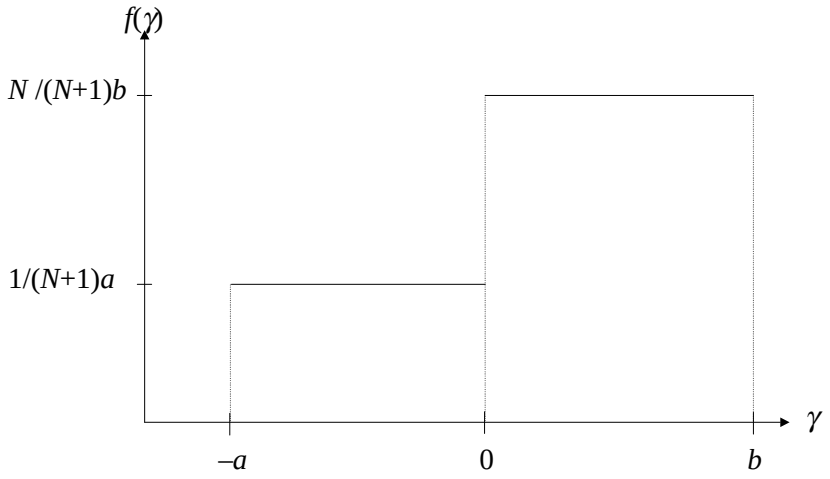

Figure 1: The density function

Thus, the absolute size of a measures the strength of the locational bias for country 1 and the size of b the bias for country 2; the distribution is described in Figure 1. When $a = b$ country 2 has N times as many workers for each particular level of locational preference (moving cost); this case corresponds to the natural reference case where location preferences are completely symmetric across the $N + 1$ countries.

Defining $\lambda \equiv L_1/(L_1 + L_2)$ as the share of workers in country 1, any situation where workers reside in their preferred country (wages not necessarily being equal) is characterised by

$$\lambda = \begin{cases} (a + \widehat{\gamma})/(N+1)a & \text{for} \quad \widehat{\gamma} < 0 \\ (b + N\widehat{\gamma})/(N+1)b & \text{for} \quad \widehat{\gamma} \geq 0 \end{cases} \tag{6}$$

where $\widehat{\gamma}$ is the cut-off value of γ; i.e., the value for which each individual with $\gamma < \widehat{\gamma}$ chooses to reside in country 1, and the rest of the individuals choose to reside in country 2. Thus, our initial situation with $L_2 = NL_1$ (i.e., $\lambda = 1/(N+1)$ and $\widehat{\gamma} = 0$) and with $\omega_1 = \omega_2$, is an equilibrium where no individual would want to change location.

3 Productivity shocks

We will consider multiplicative shocks to productivity. Formally, a shock transforms the production function in the country in question to

$$X_j = \eta \cdot A L_j^{\alpha} T_j^{1-\alpha}. \tag{7}$$

A positive shock in country 1 thus makes country 1 more efficient in the production of the manufacturing product.

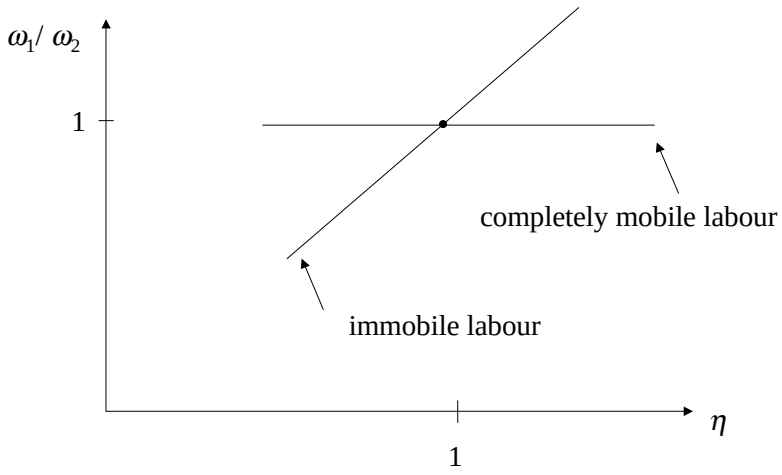

Figure 2: The reference cases

Productivity shocks and wage flexibility—two reference cases

The main point of this paper is the characterisation of the way in which real wages are affected by country-specific shocks when labour is imperfectly mobile. To clarify the mechanics of the model, it is helpful to consider the two polar cases of completely mobile labour on the one hand, and immobile labour on the other. While we view the former case as merely an idealised reference case, the latter will be helpful for discussing real-world adjustment channels.

Completely mobile labour When labour is completely mobile, wages are always equalised; $\omega_1/\omega_2 = 1$ independently of the shock, η. This is illustrated by the horizontal line in Figure 2. Starting from the initial equilibrium with $1/(N+1)$ of the labour force residing in country 1, and the rest of the labour force in country 2, a positive shock to country 1 leads to a relocation of labour after which

$$\frac{1}{N\left(\frac{1}{\eta}\right)^{\frac{1}{1-\alpha}}+1} > \frac{1}{N+1}$$

of the labour force ends up residing in country 1. Moreover, no adjustment costs are incurred due to this re-location; the adjustment is in this sense *first-best*. The gains, however, are not equally distributed with real return to terrain in country 2 falling.

Immobile labour When labour is completely immobile, wage adjustment is the only channel through which the economies can adjust to output shocks. From (3) and (7) it follows immediately that the relative real wage in the country subject to the shock, η, is proportional to η.

Thus, if the shock hits country 1, the ratio ω_1/ω_2 is proportional to η; this is illustrated by the 45-degree line in Figure 2. Two things are worth noting regarding this case. First, there is a social loss compared to the case with mobile labour; the immobility of labour amounts to an inefficient world allocation of factors. Secondly, this outcome corresponds to the case with flexible wages. In the absence of wage adjustment, unemployment would be the outcome.

Productivity shocks in the small country

Consider the effects of a productivity shock η in country 1. Using (6), long-run equilibrium (after migration has taken place) must be characterized by

$$\frac{\omega_1}{\omega_2} = \frac{1+\widehat{\gamma}}{1-\widehat{\gamma}} = \frac{1+a((N+1)\lambda-1)}{1-a((N+1)\lambda-1)} \quad \text{if} \quad \widehat{\gamma} < 0; \tag{8}$$

i.e., if there is migration *from* country 1 to country 2, and

$$\frac{\omega_1}{\omega_2} = \frac{1+\widehat{\gamma}}{1-\widehat{\gamma}} = \frac{N+b((N+1)\lambda-1)}{N-b((N+1)\lambda-1)} \quad \text{if} \quad \widehat{\gamma} \geq 0, \tag{9}$$

i.e. if the other case applies.

From (3) we have

$$\frac{\omega_1}{\omega_2} = \eta \left(\frac{1-\lambda}{N\lambda}\right)^{1-\alpha} \tag{10}$$

Equations (8), (9), and (10) allow us to solve for the relative real wage and λ as functions of η. Figure 3 shows how the relative real wage changes with productivity in the small country. The significant feature of the relationship between the relative wage, ω_1/ω_2, and the shock, η, is that it is *kinked*; the (relative) wage increase resulting from a positive shock is smaller than the relative wage decrease following a negative shock.

To facilitate intuition, consider the case where $a = b$, i.e. where there is no intrinsic difference in the distribution of locational preference between the two countries. Without migration, productivity differences would be fully reflected in the relative real wage as illustrated by the steep line in Figure 3. If labour were perfectly mobile, on the other hand, relative wages would stay equalized as shown in the figure by the horizontal line. Evidently, imperfect labour mobility will produce an intermediate outcome. The response, however, is asymmetric for positive and negative shocks.

Consider a country at the kink at $\eta = 1$ and $\omega_1/\omega_2 = 1$. A positive productivity shock leads to immigration, but since the immigrants are workers who prefer to reside in country 2 there must be a compensating wage differential; therefore the relative real wage curve has a slope between 0 and 1 to the right of $\eta = 1$. For a negative shock, the mechanism is similar; the relative real wage, ω_1/ω_2, must decrease in order that workers preferring to reside in country 1 have strong enough incentives to move to country 2. That is, the relative real wage must fall in the small country. The *magnitudes* of the necessary wage adjustments are, however, determined by the "critical worker's" location preference, $\widehat{\gamma}$. This induces the asymmetry: when country 1

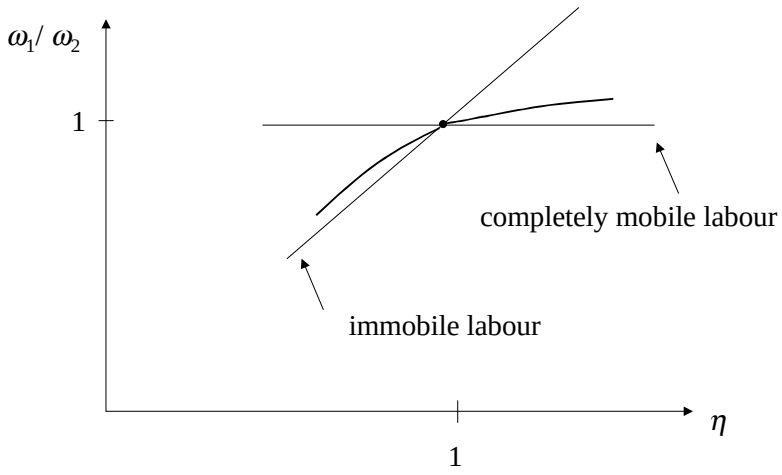

Figure 3: The relative real wage schedule for a small country

is subject to a positive shock, there is a large number of workers in (the large) country 2 that are almost indifferent (γ_i close to zero but positive) between staying and moving, and therefore a small adjustment of the relative wage suffices to re-establish an equilibrium choice of country of residence. When, on the other hand, country 1 is subject to a negative shock, migrants are country-1 residents; since (the small) country 1 has much fewer workers that are almost indifferent between the countries, the adjustment must dig much deeper into the distribution of workers.

It is illustrative to see the effect of N growing large. When N goes to infinity, the relative wage as a function of the shock converges to the lower envelope of the two straight lines in Figure 3. In this case, positive shocks are countered by immigration, while negative shocks can be absorbed only by wage decreases.

Effects on the large country

Consider now the effects on the large country (country 2) of the shock, η, hitting the small country (country 1) that we considered above. The forces at work lead to effects that are essentially a mirror image of the effects a country 1: in *relative* terms the shock η hitting country 1 has the same effect as a shock $\nu = 1/\eta$ hitting country 2. A positive shock in country 1 ($\eta > 1$, and thus $\nu < 1$) leads to migration of almost-indifferent workers and only minor wage adjustments; a negative shock in country 1 requires that the country-1 relative real wage falls and hence that the country-2 relative wage increases significantly. The situation is depicted in Figure 4; note that the figure depicts the country-2 wage relative to the country-1 wage, w_2/w_1.

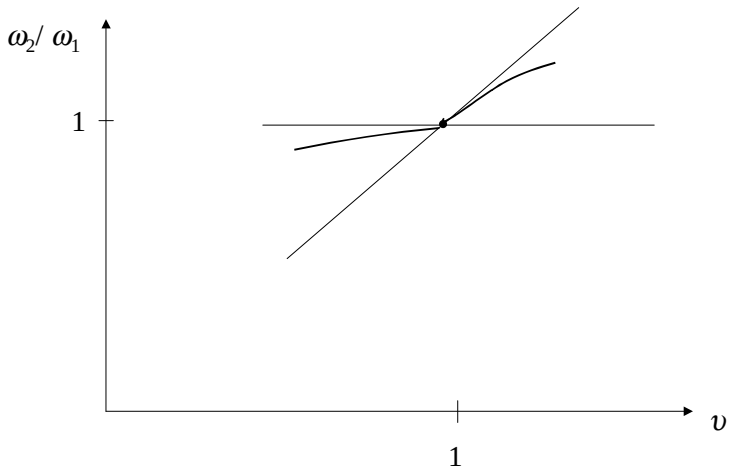

Figure 4: A shock hitting the large country

Since we consider a shock hitting country 1, this picture shows only relative wages; it is not a picture of the real wage of country-2 workers, which is constant (the real wage is determined by the domestic shock and the number of workers). The picture does, however, also show the case when the large country is hit by a shock ν. In such a case, the *real wage* in country 2 *is* affected, and the situation depicted in Figure 4 applies to the real wage. A significant feature of this situation is the non-convexity of the real wage at $\nu = 1$. This non-convexity implies that the large country will *benefit on average* from small output fluctuations if the policymakers in the large country have an objective function that is aligned with the real wages of its (current) citizens and if adjustment problems for small shocks are relatively small.

Heterogeneous labour mobility

It is possible that the locational preferences are different for the two countries, i.e. that $a \neq b$. It is, for instance, well empirically documented that high skilled workers have a higher propensity to migrate than low skilled workers.[6] It is therefore possible that a country's development or education level affects the locational preferences.

If, for instance, workers in the large country are less mobile (b larger) this will dampen the asymmetry. If $b = Na$ the different locational preferences exactly compensates for the difference in country size, as can easily be verified in (8) and (9). In this case the kink disappears. Indeed, if $b > Na$ the kink is reversed. In effect country 1 is now the large country in terms of supply of mobile workers—the small country has a larger pool of workers willing to move for each

[6] See e.g. Shields and Shields (1989) and Schröder (1996).

compensating wage differential.

Let us consider in some detail the case where the labour force in the small country is significantly more mobile than the labour force in the large country, i.e. where $b > Na$. It is important to stress that while it seems plausible that citizens of small countries are more mobile, this condition requires them to be, in essence, N times more inclined to accept changing their country of residence; still, for contexts where the size difference is not too large this case may be relevant. The small country then essentially becomes large in terms of mobile citizens and the argument is familiar: if there is a positive shock there are now relatively few workers in country 2 who are almost indifferent to moving; if there is a negative shock there are relatively many such workers in country 1 since $b > Na$. The situation can be understood completely in terms of Figure 4: let the horizontal axis represent the country-1 shock, and the vertical axis the country-1 relative wage. Again, we have a non-convexity that plausibly leads to workers in the country in question—now the small country 1—likely benefitting from some output variability.

Some further comparisons

As to the importance of the weight of labour in the production function, α, it is easy to see that a lower α—i.e. stronger decreasing returns to the mobile factor—will increase the asymmetry by making the curves more concave and the kink more pronounced. This effect can be most starkly illustrated by considering a hypothetical case with constant returns to labour, i.e. $\alpha = 1$. With constant returns to labour, the wage would be determined completely by the technology and unaffected by migration; i.e., in such a case all adjustments would be made by means of migration. Consequently, no kink would appear (relative wages and productivity would be described by the 45-degree line). Note, however, that there would be an asymmetry in realised migration costs in the sense of total disutitlity of adjustment.

Returns to terrain—the fixed factor

So far we have ignored what happens to the returns, r^T, to the fixed factor T. From (3) and (4) we see immediately that the expression $(1-\lambda)/N\lambda$ shows up in the relative returns to terrain in the two countries as well as in relative wages; with the shock η hitting country 1, we have

$$\frac{\omega_1}{\omega_2} = \eta \cdot \left(\frac{1-\lambda}{N\lambda}\right)^{\alpha}, \quad \frac{r_1^T}{r_2^T} = \eta \cdot 1/\left(\frac{1-\lambda}{N\lambda}\right)^{1-\alpha}.$$

Now consider a positive shock, $\eta > 1$. We know from the analysis that

$$1 \leq \frac{\omega_1}{\omega_2} = \eta \cdot \left(\frac{1-\lambda}{N\lambda}\right)^{\alpha} \leq \eta \;\Rightarrow\; \frac{1}{\eta^{1/\alpha}} \leq \frac{1-\lambda}{N\lambda} \leq 1;$$

the lower bound corresponds to fully mobile labour, and the upper bound to immobile labour. This implies that

$$\eta^{(1-\alpha)/\alpha} \geq \left(\frac{1-\lambda}{N\lambda}\right)^{-(1-\alpha)} \geq 1,$$

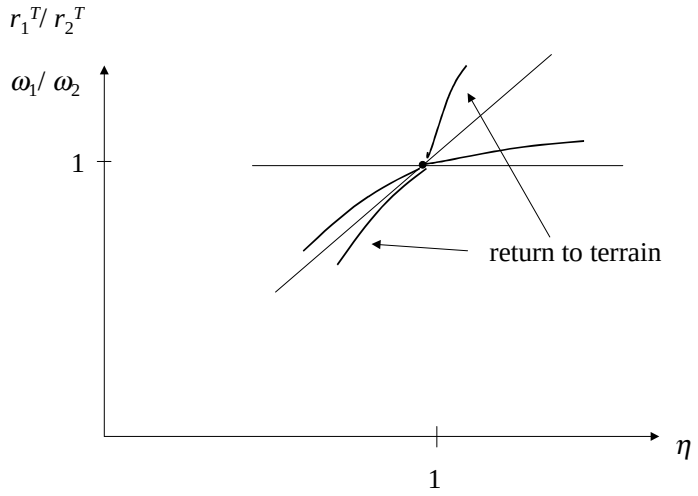

Figure 5: Relative returns to terrain

and hence that

$$\eta^{1/\alpha} \geq \frac{r_1^T}{r_2^T} = \eta \cdot \left(\frac{1-\lambda}{N\lambda} \right)^{-(1-\alpha)} \geq \eta;$$

i.e., that relative returns to terrain in country 1 increases by *at least* the factor η, and that the increase is larger if there is migration. A similar analysis of a negative shock shows that returns to terrain decrease by at least the factor η, and the decrease is larger if there is migration. Thus, while migration dampens the effect of a shock on wages it magnifies the effect on the returns to terrain.

The relative returns to the fixed factor is the inverse of the relative returns to labour; essentially, relative returns to terrain is the mirror image of the relative wages in the 45-degree line. This is illustrated in Figure 5. If $\alpha > 0.5$ decreasing returns are larger for terrain, which implies a more pronounced kink for this factor, for $\alpha < 0.5$ the opposite is true.

The implications of this property depends on the identity of the owners of terrain. Suppose first that terrain is owned by domestic owners. Some of the implications are then quite obvious. There is, for example, a conflict of interest between workers and the owners of terrain. Whereas workers benefit from out-migration in response to negative shocks, they are hurt by in-migration in response to positive shocks. Owners of terrain are affected in the opposite way, being hurt by out-migration and helped by in-migration. A somewhat less obvious implication is that workers and owners of terrain are likely to have opposite preferences regarding small fluctuations; in the main case depicted in Figure 5 of a small country not having an extremely mobile population, owners of terrain will benefit on average from small fluctuations whereas workers will lose.

It is worth pointing out, however, that it is quite natural to assume that terrain (or capital)

is owned by someone else than domestic citizens. In such a case, owners of capital—while having the preferences described—need not enter the considerations of a domestic government.

4 Welfare aspects

This section is devoted to some tentative discussion of welfare effects. We will consider welfare for each of the two countries, and will let welfare be defined by expected wages. The discussion will be based on a number of special but plausible cases. In all cases considered, we will assume that mobility is evenly distributed across countries; i.e., essentially, that $a = b$.

Consider first a small country in the case with ownership of terrain dispersed internationally. Note that there is no inconsistency between the notion that expected returns be equalised across countries, and the various patterns of variability of returns encountered here. In this case, the workers in a small country are faced with the situation depicted in Figure 3. That is, the real wage will be volatile with a downward bias created by the kink. Obviously there are significant welfare costs associated with idiosyncratic economic fluctuations in such a case.

A somewhat less obvious comparison is that between this situation and the situation which is similar except for workers being immobile and there being exchange-rate adjustment possibilities. The latter situation is characterised by wages being flexible by means of the exchange rate; i.e., the 45-degree line in Figure 3. Thus, welfare in the sense we have defined it will be lower when exchange-rate flexibility is replaced by imperfect labour mobility.

Consider next a small country with ownership of terrain dispersed across the domestic population. Whereas the welfare discussion from the preceding paragraphs still applies to workers, domestic welfare depends also on the incomes generated by ownership of terrain. As is made clear by the discussion about returns to terrain above, the key effect of mobility on a small country is to shift the gains due to positive country-specific shocks from domestic workers to owners of domestic terrain. As a consequence, the payoff to owners of terrain follows the patterns of Figure 5. Thus, whenever ownership of terrain is not distributed uniformly in the population, there is likely to be conflicts of interest between workers and owners of terrain. In terms of the comparisons made above, owners of terrain will benefit on average from small economic fluctuations. Also, the owners of terrain will be winners on average when exchange-rate flexibility is replaced by imperfect labour mobility.

5 Discussion

Real world policy discussions regarding country specific-shocks center on unemployment. In our model wages are flexible and the labour market is in equilibrium. However, in a setting with inflexible wages, large movements in relative real wages would translate into large swings in employment. In particular, if one believes that wages are downward rigid it is natural to

think of the adjustments to negative country-specific shocks in terms of unemployment.[7]

More fundamentally, however, the basic result of our analysis is independent of whether factor markets clear: factor market pressures created by a positive shock are smaller than the pressures created by an equally sized negative shock in a small country; the opposite is true for a large country or a small country with extremely high labour mobility.

For these reasons, we believe that the basic messages of the model are valid more generally. There are two main messages. First, it is not appropriate to draw conclusions regarding the effects of negative country-specific shocks on the basis of the experience from positive shocks. The key adjustment mechanism constituted by labour mobility in response to compensating wage differentials is fundamentally asymmetric. As we noted in the Introduction, the current Irish experience seems well in line with the model, and our caveats are thus particularly pertinent in that regard.

The other main message of the model is equally important. Those parts of the labour forces in small countries with fixed exchange rates that are left behind when mobile workers move are likely losers from economic fluctuations. Obviously, the most mobile workers are winners. In addition, capital owners are likely winners. It seems appropriate to us to draw the following conclusions from this. First, small countries—which we assume are guided to a large extent by their non-migrating parts of the labour forces—have good reasons to try to avoid or dampen economic fluctuation. These reasons are, moreover, stronger than were the case if labour were immobile and exchange rates flexible. Secondly, small countries have good reasons to encourage the flexibility of their entire labour forces. Although this goal may seem natural, it seems that it might conflict with the goal of becoming and staying attractive for mobile labour. We do not have specific policies on this point. In particular, we would not maintain that the dismal aspects of Irish history is the ideal breeding for the flexible labour called for by the monetary union. We believe, however, that the insight is important in its own right.

[7] Although there has been some controversy on this point, the over all evidence seems firm. Akerlof *et al.* (1996) provide a comprehensive assessment of the evidence both at the firm level and in aggegate data (as well as some complementary evidence), and condlude that downward rigidity is strongly supported.

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